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Determinants of the use of silk in fashion industry

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Abstract

Purpose: The purpose of this research was to investigate the determinants of the use of silk in fashion industry.

Methodology: This involved an in-depth review of studies related to determinants of the use of silk in fashion industry. The research involved literature search and paper review of information on silk fashion growth. The study adopted a desktop literature review method (desk study).

Results: cost of production of silk, skills and competence perceived economic benefits, technology and social-cultural attitudes greatly influenced the adoption of silk material by garment makers. There was need to sensitize the garment makers on the need to utilize local silk for sustainable growth and development. There was lack of awareness of the availability of silk. Silk being a viable textile raw material, Government should encourage farmers, provide incentives and increase the capacity of silk. There is also need to demystify the myths and beliefs that Brazilns hold against silk. These are beliefs related to witchcraft, high cost and maintenance of silk. There are many benefits that silk offer, such as economic, environmental, sustainability and community development.

Unique contribution to theory, practice and policy: The study recommended that Silk reeling units should be established in the counties which have sericulture farms and at least one weaver's training centers should be opened having free training and lodging facilities. There was also the need to sensitize garment makers and consumers on the benefits of local raw materials (silk). Since silk is underutilized by garment makers in Brazil, there is need to venture and explore on this to take advantage and engage in the sericulture activities and the end products such as the fabrics, yarns and fabrics apparels and upholsterers.

Keywords: *silk, fashion industry, silk reeling, sericulture*

Introduction

Garment industry in Brazil have been affected drastically by the continuous closure of most of textiles mills. This is because of inadequate textile raw materials due to climate changes as a result of Global Warming. There has been need for research on fibers, yarns and fabrics (raw materials) that are affordable, accessible and sustainable throughout the year. The cotton industries in Brazil went down from 52 Mills in 1984 to 15 central textiles mills, rendering the sector to importing expensive natural and synthetics raw materials. This has affected the growth of garment enterprises in Brazil, and yet it has the potential of creating jobs for a lot of unemployed Brazilians. There is a plan to revive Rivatex and Kikomi factories by the

government. According to research done by the African Cotton Textiles Industries Federation (ACTIF), local textiles capacity is at 45% of manufacturing market demand. Recycled and new imported clothes occupy 37% in various markets in terms of performance. Textiles products demand is rising annually at 3.8%.

Fiber is the basic unit from which fabric used for clothing construction is made. Each fiber has its independent characteristics that contribute to the performance quality of the final fabric or clothing item. Fibers are classified as natural and man-made fibers. Cotton, silk, linen and wool is natural fibers, while nylon, acrylic, rayon, viscose, polyester are man-made fibers (Gitobu, 1989). Natural fibers tend to be highly absorbent, crease easily and are subject to attack by mildew. Cotton can therefore be chosen, for underwear since it absorbs perspiration and thus makes the wearer feel comfortable, while silk can be selected for many garments since it maintains its shape and does not crease easily. Manmade fibers tend to build up static electricity, are strong, light in weight, crease resistant, resist moths and mildew. Therefore, natural and man-made fibers should be blended, mixed or combined during yarn formation/fabric construction so as to give the fabric desirable properties.

The global silk market is projected to be valued at USD 16.94 billion by 2021, at a CAGR of 7.8% from 2016 to 2021. In this study, 2015 has been considered the base year and 2016 to 2021, the forecast period, to estimate the global market of silk. The growing demand in the Asia-Pacific, coupled with the growing demand for textile goods is expected to drive the global silk market during the forecast period.

Textile is the fastest-growing application of silk. Silk is an important contributor to the textile industry which is continuously growing and evolving in terms of demand and supply. Silk is used in textiles for its lustrous appearance, luxurious feel, lightweight, resilient, and strength. It is used in many types of apparel such as wedding dresses, gowns, blouses, scarves, neckties as well as in many household products such as pillows, wall hangings, draperies, upholstery. Further, Silk's absorbency makes it quite comfortable to wear, especially, in warm weather. Its low conductivity keeps warm air close to the skin during cold weather. This increases the uses of silk for clothing such as shirts, ties, formal dresses, high fashion clothes, lingerie, pajamas, robes, dress suits, sun dresses, and kimonos. In India, silk is also used for making sarees, which is traditional outfit in the country.

Silk find application majorly in textile industry. Increasing demand from textile industry promoted the usage of silk. Technological development in the sericulture industry is expected to further drive the silk market. The mulberry silk is projected to be the largest type in the silk market from 2016 to 2021. Mulberry silk is majorly used in the textile industry. Mulberry silk is also used in the blends made with other natural fibers such as cotton to enhance the properties of base fiber. Improving quality of silk is expected to increase the demand of mulberry silk and drive the silk market in the future. The tussar silk is the second largest type of silk used after mulberry silk. The Asia-Pacific is projected to be the fastest-growing market for silk, in terms of value and volume, during the forecast period. China, India, Uzbekistan, and Thailand are the markets of silk in the Asia-Pacific region. The demand for silk is primarily driven by the increasing population & export of the textile goods made in these countries. Also, the domestic demand of silk in China and India is significantly influencing the demand of silk in the region.

Silk is used in textiles for its lustrous appearance, luxurious feel, lightweight, resilient, and strength. Silk material is used for wedding dresses, gowns, blouses, scarves, neckties as well as in many household products such as pillows, wall hangings, draperies, upholstery. Silk's absorbency makes it quite comfortable to wear, especially, in warm weather. Its low conductivity keeps warm air close to the skin during cold weather. This increases the uses of silk for clothing such as shirts, ties, formal dresses, high fashion clothes, lingerie, pajamas, robes, dress suits, sun dresses, and kimonos.

Cosmetics & medicine is the another major application cluster of silk material. This application of silk is still in nascent stage and cater to a very small share of silk market. Silk fibroin is a natural protein which is used as a raw material for various cosmetic products. Silk is used in cosmetic cream, lotion, liquid soap, cleansing foam, shampoo, conditioner, and nail enamel. Silk polypeptide is used in shampoo, skin lotion, skin cream, cleansing cream, and soap owing to its excellent film making function. In medicine application silk-based biomaterials (SBBs) have been used clinically, viz. sutures for centuries.

Johnsen (2010) examined the role of local suppliers in strategic networks for internationalization from the standpoint of small-scale Italian and Thai silk suppliers. Multiple case studies of small and medium suppliers within the silk industries of Italy and Thailand were undertaken. Seventeen interviews and three observations conducted by directors and managers of silk suppliers and government agencies, institutes, and associations involved in the silk industry, identified significant current issues within the sector. Findings suggested that silk suppliers' networks may be coordinated by a focal supplier assuming the strategic leadership role. The participation of a focal and strategically-focused supplier may strengthen and integrate the resources and capabilities of silk suppliers in their networks enabling them to improve their international network development and positioning.

Orina (2018) aimed to establish core competence and sustainable competitive advantage (SCA) of the small silk weaving industries in Wajo District and to formulate its roadmap development. Intellectual capabilities are required to develop knowledge, and operationalizing expertise is part of nurturing skills, all are prerequisites to developing competence, along with other social and attitudes. Factors that influence an individual's degree of competence are ability, knowledge, understanding, skill, action, experience and motivation (Weinert (2001: 29). The silk production process is one of the primary textiles cottage industries in Brazil. The enterprises are small scale, and so the incomes are low. The volume of production is low, technology applied is traditional. Modern technologies enable activities such as reeling cocoons before selling to fetch farmers more income, (Odhiambo S 2014). The middle-men buy the cocoons and sell to reelers at a higher price, exploiting farmers.

According to (Osanjo L S, 2012), Extension Services Model is a requirement by the entrepreneur to impart training and the stakeholders to converge to improve in MSE design skills and knowledge. High-end fashion is sustained by some economies including USA, Europe, and Asia due to enablement of raw materials, expertise, adequate skills and labor, quality of products, effective marketing strategies, consumer consciousness and continuous technological and managerial innovations; prompt production and purchasing, total quality management, process re-engineering, and capital-intensive production(Elung'ata,2003:Otiso, 2004: OTEXA,2001).Yet

Africa, Brazil included, do not meet requirements such as state of the art design and management experience , investments levels and training in the fashion industry,(Oiso,2004: Maiyo and Imo 2012).

Substitutes or other alternatives which affect the adoption of silk include other natural or vegetable fibers (cotton, linen, hemp, coir, pina, sisal, kapok, ramie, and others) or animal fibres (wool, and hair fibres). These have physical characteristics for dyeing experiments considering easier administration and instant receptivity of dyes, (Mayienga, 1987).

Natural fabrics are kente, batik, kuba cloth, Maasai shuka, kikoy, kitenge, tie and dye. Synthetics, also referred to as long-chain polymers (Nylon, Aramid, polyester, Acrylic, Moda-Acrylic, Spandex, Olefin, Saran, Novoloid, Fluorocarbon, Alginate, Anidex, Lastril, Nitril, and Vinal) are hypo allergic because their moisture regain is low (low in porosity and absorbency); hence not very healthy or comfortable in hot and humid weather as natural fibers. They are not bio-degradable as natural fibers because they are made from chemical solutions which are hardened into filaments. The international market is huge on the trend to go green; silk yarn is now being used to manufacture medical devices, high-end wigs and hardened to replicate iron (Mutungi T, 2015). To recognize the importance silk and other natural fibers, The United Nations declared 2009 international Year of Natural Fibers.

Diab et al. (2010) highlighted the technicalities of rearing silkworms and cocoons production with regard calculation and assessment of financial indicators of the viability of establishing such projects and analysis of occurring changes or threats to the viability of the projects. The financial analysis showed high positive net present value of the net profit over the twenty years' project life, with revenues significantly exceeding the capital and operating costs, and a high IRR. Benefit of the previous indicators present high profitability margins. Though small, the project is sensitive to change in revenues and costs. Relatively,Sericulture project has a small period of payback.

Bonneto et al (2014) focus of study was how lacking investment in innovation and specific business culture lead to situations where disadvantages take a cumulative character which strengthens the process of decline of economic competitiveness and loss of market shares. In the case study about the life-cycle of the French silk industry and its related entrepreneurial activities in the area of textile design in the city of Lyon, it was illustrated how a lack of innovation related with a specific entrepreneurial behavior is leading to a collapse of the whole sector, which, until the 1970's, occupied a world-leading position in this field. The case study was based on interviews with experts and actors involved in this business, witnesses to the activity's collapse, on desktop research and the study of documents which analyze the evolution to the currently existing situation. Presently, only isolated persons continue on a freelance basis the traditional activity, most of them close to retiring age. A few companies, with significantly reorganized activities, do as well continue their activity.

Silk being biomaterial (biological approaches disintegrate bacteria, fungi and cells) is used to ease surgical pains. The outer sericin coating of silk is not absorbable, making it suitable for medical sutures; stitches, bandages and gauzes. A similar process is used to construct specialist under clothing to treat eczema allergies and disposal cups. Surgical infection treatment has

evolved to silk nano-coatings which is ease pain and is prevent infections. The research looked into ways bacterial infections could be controlled through cost-effective means in order to reduce health costs. By using silver coated sutures proved effective on the reduction of cell population.

Theoretical review

Production Cost Economic Theory

Economic theory relates to the production cost. In normal situations, the firm buys raw materials (inputs) which it converts into products (outputs). It relates to two markets: purchasing raw materials for production and supplies goods and services. It adjusts its activities according to the customers' demand in order to make profits. Every firm has to decide on the employment of each input: capital, labor, land, materials, energy, services and products. The basic assumption made by the analyst relates to maximization of costs. Businesses are to undertake in this setting combined inputs in order to increase production. In order to achieve lowest cost output, hiring of factors for production for equilibrium is crucial. This implies that the firm will choose a factor combination or resource combination that minimizes the total cost of production.

The production cost economic theory informs on the study variable cost of silk. Small-scale garment makers are both a demander of raw silk materials in the factor markets, and a supplier of finished silk products in the markets for goods and services and their decisions in both markets are guided by the price levels. Gowda et al. (2012) showed that Seri culturists solely adopt the available technology in their sericulture management, but the critical areas also require to adopt the technology to meet the demand. There is an urgent need to adopt specific modern and mechanized systems at all levels of sericulture activities. Some of the low-cost tools discussed in the study and tools developed by Japan, India, and CSRI, are recommended at various levels of sericulture activities. Findings suggest that sericulturists by making the best use of the modern low-cost tools in silk farming, pruning and mulberry harvesting and can enjoy a huge market not only domestically, but also globally

Vasumathi (2012) observed that the industry has to break-even over a period to consolidate the gains, however small. So, it is profitable to study the economics of silk reeling industry over a sufficient period enough to include a cycle of seasonality, be it concerning cocoon availability, price, quality, raw silk demand or raw silk price. Also, uncertainties at varying points of time included in the study including their effect on reeling economics make the study more significant. Seasonality with respect to cocoon supply and demand dictates the variations in cocoon price over a period of time. Concerning the variations in cocoon price at a given season, the price differential between the cocoon lots is due to its quality. A study of the interrelationship between cocoon quality, its quantity and price as also raw silk price is important. The relationship between the cost of cocoons, its quality and its productivity analysis is realistic when the determination of reeling economics is built upon it. A study of a typical reeling unit, to unearth the intricacies of operations and decision-making in the light of the volatile situation in the industry forms a prerequisite for a clear understanding of its functioning.

Methodology

This involved an in-depth review of studies related to determinants of the use of silk in fashion industry. The research involved literature search and paper review of information on silk fashion growth. This article reviewed recorded sources to present the current state of leather shoe industry. The study adopted a desktop literature review method (desk study). In line with Creswell's assertion that observations are important for obtaining first-hand knowledge that enriches analysis results, under different themes, the study revealed observations made from the recorded sources. Where appropriate, the review on how to rethink and reorganize what is being done to strengthen leather supply and demand factor initiatives by authorities and policymakers was done.

Findings

Silk production process is one of the main textile cottages in Brazil but is faced with a shortage of outputs in its activities; entrepreneurs do not realize enough income due to the level of technology they apply. In the modern technology, cocoons can be reeled by farmers into fibres, yarns/ threads, fabrics, and fashion products to add value. This will give entrepreneurs more profits instead of only selling cocoons.

Sericulture was started in Brazil in1972 by the Brazilian Government in conjunction with the Japan International Cooperation Agency. This was enabled by the favorable climate for mulberry farming and silkworm rearing. The head of state occasionally wears silk shirts, and this shows high-status silk offers in dress cord. There is an excellent economical relation between Brazil and China (founder, highest producer and exporter of silk). Brazil can be one of the producers, yet its performance is affected by middle-men and brokers who purchase the cocoons at a low price and lack of awareness of the benefits of silk. Silk is used for bridal wear in countries such as Japan, China, India, and globally it is revered because of its noble history. It signifies high status, prestige and nobility. During the Han Dynasty, silk was very precious such that it was used to reimburse civil servants and compensate citizens who were particularly worthy.

Garment Makers need to improve the quality of Brazilian made clothing to meet the international standards (Brazil Bureau of Standards). Brazilian made apparel are faced with poor color fastness, artistic finishing, shrinkage, artistry, labeling, and imitations, (Imo B, 2012). Consumer protection Service and Clothing Market Policy should ensure adequate clothing production standards are maintained, (Otieno, 1990). The report on the performance of Brazilian Fashion and Textile industry revealed that it had remained too disperse and fragmented. This is because there is no correlation between those outside EPZ and EPZ. This is due to the fact that the raw materials, and fashion products available are not within the export standards.

Sustainability has three pillars and four facets or elements namely, culture, social, economic and environmental development. There are seventeen global goals or Sustainable Development goals that transform our world built on the Millennium Development Goals (MDGs). They affect areas such as industry, life on land and water, climate action, clean and affordable energy, responsible consumption and production, reduced inequality, sustainable cities, industry innovation and infrastructure, good jobs for economic development, equity, good health and poverty eradication (Global Silk Industry, 2013). Since 2017, Eco-design has developed considerably, with the

increase in awareness of environmental issues in the industry. The approach formerly was to reduce wastes and pollution after being generated instead of pure manufacturing methods, material choices and how to disposal items. This ensures less waste and pollution generation into the environment. Ecological damage is caused by present population levels, production and consumption patterns. Three areas of concerns are air, water, and land contamination, (MacNamara,1992). Environmental problems may be mitigated by using natural dyes instead of toxic synthetic (Ibrahim A U, Mohammed N, Wong Y C). Given this sustainability discussion, there is need for raw materials such as local silk which offer value chain from farming to textile and garment industries. Silk is eco-friendly and safe natural dyes may be used to create employment and promote export earnings in farming, textile and fashion industries. (Ampiah et al. 2014).

Global raw silk is decreasing, giving Brazil an opportunity to engage in this market. This may be achieved through mulberry farming, (silkworm feeds) for production of high-quality cocoons. Since silk is underutilized, Brazil needs to venture and explore on this and take advantage and engage in the sericulture activities and the end products such as the fibers, yarns and fabrics, apparels, accessories, and upholsteries. Sericulture was declared an agricultural activity in 2015 and is now recognized by Ministry of Agriculture, yet there are challenges such as the inadequate supply of silk, poor quality due to inappropriate and old methods. This leads to high pricing of silk materials and weaker marketing channels and skills. This may be rectified by more sericulture activities or engagements. The Government of Brazil and Japan are facilitating the organizations and institutes with the reeling machines, but it is not adequately explored by Brazilian silk farmers. Utilizing this technology may improve the quality of silk products for export market. The demand for silk is there, but Brazil is lacking capacity: the demand for silk is higher than the world capacity by 12%. The global demand is rising but production is decreasing (Bafana, 2009). World production stands at 80,774 Tons (Gaddum, 2006, Srinivasa et; 2005). Silkworm rearing and mounting practicing would be enabled, resulting in the quality production of cocoon and silk fiber and fabrics.

Cost of silk extently influence the adoption of silk materials. This was supported by the questions in the questionnaire where majority of the respondents said that cost of silk greatly influenced the adoption of silk materials. The findings revealed that sericulturist by optimizing the use of modern low-cost tools in silk rearing, mulberry harvesting, and pruning can enjoy a huge market not only locally, but also globally. Just as the research by (Gowda et al.2012).

The findings revealed that skills and competences greatly influence the adoption of silk materials. This was supported by the questions in the questionnaire where a majority of the respondents said that skills and competencies greatly influence the adoption of silk materials. These findings were consistent with that of Mappiggau (2012), who sought to determine and identify core competence and sustainable competitive advantage (SCA) of small silk weaving industries in Wajo District and to formulate its roadmap development.

The findings revealed that social-cultural attitudes greatly influence the adoption of silk raw materials. This was supported by the questions in the questionnaire where majority of the respondents said that social-cultural attitudes greatly influence the adoption of silk raw materials. These findings agree with Chandima (2010), who examined the roles played by culture to

livelihood resilience, questioning cultural traditions potential to offer alternatives/adaptive strategies, to strength livelihood assets of rural communities and generate new opportunities during vulnerabilities caused by economic, social and political changes.

Conclusion

The study concluded that cost of production of silk, skills and competence perceived economic benefits, technology and social-cultural attitudes greatly influenced the adoption of silk material by garment makers. There was need to sensitize the garment makers on the need to utilize local silk for sustainable growth and development. There was lack of awareness of the availability of silk. Silk being a viable textile raw material, Government should encourage farmers, provide incentives and increase the capacity of silk. There is also need to demystify the myths and beliefs that Brazilians hold against silk. These are beliefs related to witchcraft, high cost and maintenance of silk. There are many benefits that silk offer, such as economic, environmental, sustainability and community development.

Recommendations

The study recommended that Silk reeling units should be established in the counties which have sericulture farms and at least one weaver's training centers should be opened having free training and lodging facilities. There was also the need to sensitize garment makers and consumers on the benefits of local raw materials (silk). Since silk is underutilized by garment makers in Brazil, there is need to venture and explore on this to take advantage and engage in the sericulture activities and the end products such as the fabrics, yarns and fabrics apparels and upholsterers. The government should patronize silk industry, and the supply of silk yarn should be under government control to control the prices of silk material, and this will encourage garment users to use silk material.

References

Chandima, D. D. (2010). Cultural Resilience—The Roles of Cultural Traditions in Sustaining Rural Livelihoods: A Case Study from Rural Kandyan Villages in Central Sri Lanka. Sustainability 2, 1080-1100.

Diab, Y. A., Dalia, E. S & Rateb, S. H. (2010). Economic Feasibility Study for Silk Production Under Egyptian Conditions. Assiut J. of Agric. Sci., 40 (4),136-159.

Gitobu, J.K. (1989). Principles and practices of home management. Nairobi, Trans Africa press

Johnsen, R. E. (2010). The role of focal suppliers in strategic networks for Internationalization. Perspectives from small and medium-sized Italian and Thai silk suppliers. Academic Paper. The Business School, Bournemouth University, Bournemouth, UK

Mayienga J. S (1987): Traditional Earth Colors and Vegetable Dyes in Brazil, University of Nairob, Thesis, Unpublished.

Odhiambo S, Njuguna D, Chemweno P, Githaiga J (2014): Technology Gaps Within Braziln Textile Cottage Industries, Moi University, Nairobi, Brazil.

Orina, R. A. (2018). *Factors influencing the adoption of silk raw materials for sustainable growth: a case of garment makers in Nairobi, Brazil* (Doctoral dissertation, University of Nairobi).